

BIOGRAPHICAL SKETCH

NAME Bruce D. Ravel				POSITION TITLE Assistant Physicist
eRA COMMONS USER NAME				
EDUCATION/TRAINING				
INSTITUTION AND LOCATION		DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Wesleyan University		B.A.	1989	Physics
University of Washington		Ph.D	1997	Physics

Positions and Honors:

Argonne National Laboratory

Biosciences Division

Title: Assistant Physicist 2005-current

Responsibilities include: (1) Facilitate use of synchrotron radiation by environmental scientists in DOE's Environmental Remediation Science Program, (2) X-ray absorption spectroscopy (XAS) and x-ray fluorescence microscopy measurements of heavy metal contaminants in environmentally relevant systems, (3) Beamline development and user support at MRCAT, Sector 10, Advanced Photon Source, (4) Design and development of advanced software for the analysis of XAS data.

Naval Research Laboratory

Chemistry Division

Title: Research Physicist 2001-2005

Title: American Society of Electrical Engineers Research Fellow 2000-2001

Responsibilities included: (1) Research and development of novel magnetic and dielectric materials using synchrotron x-ray techniques, (2) Director of the NRL Synchrotron Radiation Consortium, consisting of three beamlines at the National Synchrotron Light Source and a staff of 5 scientists and technicians, (3) Design and development of advanced software for the analysis of XAS data.

ASEE adviser: Dr. Vincent Harris

Centre National de la Recherche Scientifique, Grenoble France

Title: Visiting scientist 1999-2000

Responsibilities included: (1) Use of anomalous diffraction to study magnetoelectric compounds, (2) staff member of beamline BM02 at the European Synchrotron Radiation Facility, (3) Design and development of software for anomalous diffraction data acquisition and analysis of XAS data.

Adviser: Dr. H. Renevier

National Institute of Standards and Technology 1997-1999

Materials Sciences Division

Title: National Research Council Fellow

Responsibilities included: (1) Development of anomalous diffraction techniques to study ferroelectric phase transitions in barium titanate, (2) Use of x-ray absorption spectroscopy to study ferroelectric phase transitions in titanate perovskites and other ferroelectric materials. (3) Design and development of advanced software for the analysis of XAS data.

Adviser: Dr. C.E. Bouldin

University of Washington 1989-1997

Physics Department

Thesis topic: Study of ferroelectric phase transitions by temperature-dependent XAS in a variety of perovskites, including lead and barium titanate, demonstrating the order-disorder behavior in their local structures through their structural and ferroelectric phase transitions. Developed a novel real space full multiple scattering approach to ab initio calculations of XAS spectra..

Advisers: Dr. E.A. Stern and Dr. J.J. Rehr

Selected peer-reviewed publications

- M.F. Lengke, B. Ravel, M.E. Fleet, G. Southam, G. Wanger, and R.A. Gordon, "Mechanisms of Gold Bioaccumulation by Filamentous Cyanobacteria from Gold(III)-chloride Complex", *Env. Sci. Tech.* (2006) in press.
- B. Ravel, Y.-I. Kim, P.M. Woodward, C.M. Fang, "Role of local disorder in the dielectric response of BaTaO₂", *Phys. Rev. B* (2006) In press
- B. Ravel, "A practical introduction to multiple scattering theory", *J. Alloys Compounds*, (2005), 401:1-2, 118-126.
- A.L. Ankudinov, B. Ravel, J.J. Rehr, and S. Conradson, "Real Space Multiple Scattering Calculation and Interpretation of X-Ray Absorption Near Edge Structure", *Phys. Rev* (1998) B58:12, 7565-7576
- Ravel & M. Newville, "ATHENA, ARTEMIS, HEPHAESTUS: data analysis for X-ray absorption spectroscopy using IFEFFIT", *J. Synchrotron Radiat.* (2005) 12:4 537-54.
- B. Ravel, "ATOMS: Crystallography for the X-Ray Absorption Spectroscopist", *J. Synchrotron Radiat.* (2001) 8, 314-316
- B. Ravel, J.O. Cross, M.P. Raphael, V.G. Harris, R. Ramesh, V. Saraf, "Atomic Disorder in Heusler Co₂MnGe Measured by Anomalous X-Ray Diffraction", *Applied Physics Letters*, (2002) 81:15. 2812-2814
- B. Ravel, M.P. Raphael, V.G. Harris, and Q. Huang, "An EXAFS and Neutron Diffraction Study of the Heusler Alloy Co₂MnSi", *Phys. Rev. B* 65:18, (2002) 184431-184438.
- W.T. Elam, B. Ravel, and J.R. Sieber, "A new atomic database for X-ray spectroscopic calculations", *Radiation Physics and Chemistry* (2002) 63, 121-128
- B. Ravel, E. Cockayne, M. Newville, and K.M. Rabe, "A Combined EXAFS and First Principles Theory Study of Pb_{1-x}Ge_xTe", *Phys. Rev. B* 60:21, (1999) 14632-14642
- B. Ravel, C. E. Bouldin, H. Renevier, J.-L. Hodeau, J.-F. Berar, "X-Ray-Absorption Edge Separation Using Diffraction Anomalous Fine-Structure", *Phys. Rev. B* 60:2 (1999) pp. 778-785
- B. Ravel, E.A. Stern, R.I. Vedrinskii, and V. Kraizman, "Local Structure and the Phase Transitions of BaTiO₃", (1998) 206-207, 407-430
- N. Sicron, B. Ravel, Y. Yacoby, E.A. Stern, F. Dogan, J.J. Rehr, "The Nature of the Ferroelectric Phase Transition in PbTiO₃", *Phys. Rev. B* 50:18, (1994)